# MPC8349E PowerQUICC® II Pro

Overview

Freescale Semiconductor's MPC8349E PowerQUICC® II Pro family of integrated communications processors is a next-generation extension of the popular PowerQUICC II line. Based on a system-on-chip (SoC) architecture, the MPC8349E PowerQUICC II Pro family integrates the enhanced e300 core, built on Power Architecture® technology, and advanced features, such as DDR/DDR2 memory, Dual Gigabit Ethernet, Dual PCI and High-Speed USB controllers. With clock speeds scaling to 667 MHz, the MPC8349E family of processors offers the highest performing PowerQUICC II Pro devices available.

The MPC8349E PowerQUICC II Pro family is designed to provide a cost-effective, highly integrated control processing solution that addresses the emerging needs of networking, communications and pervasive computing applications. MPC8349E processors can be used in applications such as Ethernet routers and switches, wireless LAN (WLAN) equipment, network storage, home network appliances, industrial control equipment, copiers, printers and other imaging systems.

e300 SoC Platform

The MPC8349E PowerQUICC II Pro family is based on the e300 SoC platform—making it easy and fast to add or remove functional blocks and develop additional SoC-based family members targeting emerging market requirements. The e300 core, built on Power Architecture technology, is an enhanced version of the 603e core used in previous generations. Enhancements include twice as much L1 cache (32 KB data cache and 32 KB instruction cache) with integrated parity checking and other performance-enhancing features. The e300 core is software-compatible with existing 603e core-based products.

MPC8349E Block Diagram
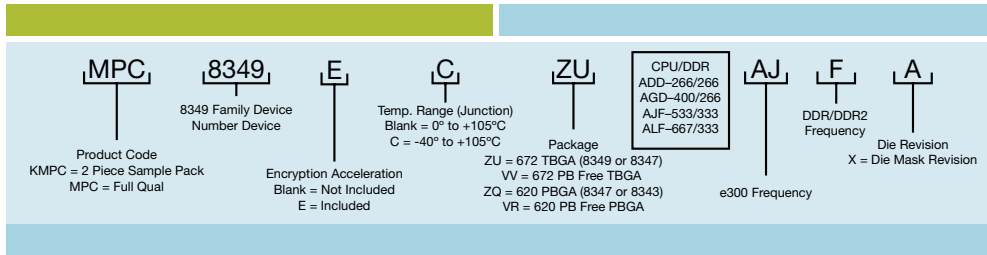

Core   Accelerators   I/O
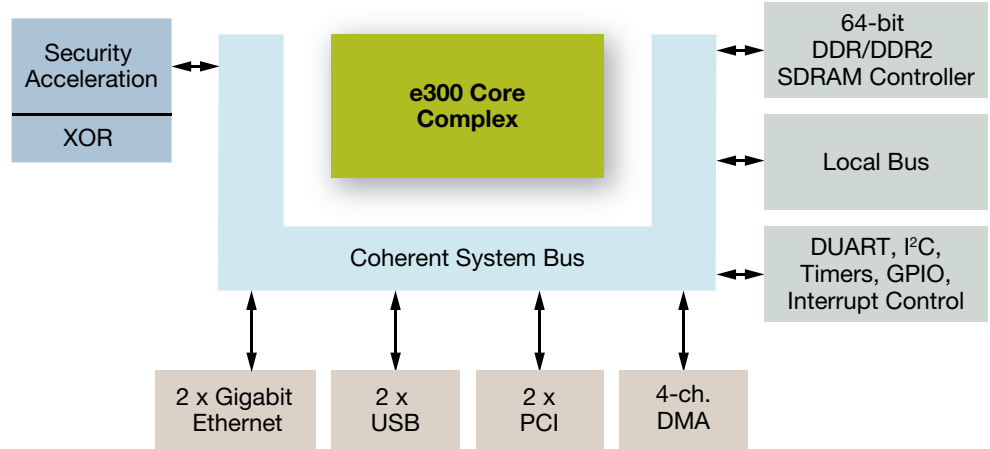
Integrated Security

The MPC8349E family features an optional integrated security engine derived from Freescale's security coprocessor product line. The MPC8349E family's security engine supports DES, 3DES, MD-5, SHA-1, AES and ARC-4 encryption algorithms, as well as a public key accelerator and an on-chip random number generator. The security engine is capable of single-pass encryption and authentication, as required by IPsec, IEEE® 802.11i standard and other security protocols. The non-E devices do not have the integrated security engine.

Key Advantages

- Price/performance for highly integrated, cost-sensitive applications
- Processor speeds up to 667 MHz
- High level of integration enabling simplified board design
- Flexible SoC platform for market-optimized designs and fast time to market
- Dual Gigabit Ethernet and Dual PCI interfaces

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Part Number Breakdown

MPC	8349	E	C	ZU	CPU/DDR ADD–266/266 AGD–400/266 AJF–533/333 ALF–667/333	AJ	F	A

MPC — Product Code
KMPC = 2 Piece Sample Pack
MPC = Full Qual

8349 — 8349 Family Device Number Device

E — Encryption Acceleration
Blank = Not Included
E = Included

C — Temp. Range (Junction)
Blank = 0° to +105°C
C = -40° to +105°C

ZU — Package
ZU = 672 TBGA (8349 or 8347)
VV = 672 PB Free TBGA
ZQ = 620 PBGA (8347 or 8343)
VR = 620 PB Free PBGA

AJ — e300 Frequency

F — DDR/DDR2 Frequency

A — Die Revision
X = Die Mask Revision

MPC8349E* PowerQUICC™ II Pro Family	MPC8349E*	MPC8347E*	MPC8343E*
Core	e300	e300	e300
I-Cache/D-Cache (KB)	32/32	32/32	32/32
Frequencies	Up to 667 MHz	Up to 667 MHz	Up to 400 MHz
Memory controller	64-/32-bit DDR/DDR2	64-/32-bit DDR/DDR2	64-/32-bit DDR/DDR2
Local bus	Yes	Yes	Yes
PCI interface	Two 32-bit (up to 66 MHz) or one 64-bit	One 32-bit (up to 66 MHz)	One 32-bit (up to 66 MHz)
Ethernet	Dual 10/100/1000	Dual 10/100/1000	Dual 10/100/1000
High-Speed USB	Dual: host and device/OTG	Dual: host and device/OTG	Dual: host and device/OTG
Integrated security	Yes, E version only	Yes, E version only	Yes, E version only
DUART	Yes	Yes	Yes
I²C controller	Dual	Dual	Dual
SPI	Yes	Yes	Yes
Interrupt controller	Yes	Yes	Yes
Package options	35 mm x 35 mm TBGA	35 mm x 35 mm TBGA 29 mm x 29 mm PBGA	29 mm x 29 mm PBGA

*Note: E in the product name designates encryption acceleration through an integrated security engine.
MPC8349, MPC8347 and MPC8343 processor versions without integrated security engines are available.

Product Family Highlights

- e300 core, built on Power Architecture technology (enhanced version of 603e core with larger caches)
- DDR/DDR2 memory controller, up to 333 MHz
- Dual 10/100/1000 Ethernet channels
- Dual 32-bit PCI interfaces (configurable as one 64-bit PCI interface)
- Dual High-Speed USB controllers
- Optional integrated security engine

Typical Applications

- Ethernet routers and switches
- Wireless LAN
- Copier/printer/imaging
- Home gateways/media gateways
- Network-attached storage (NAS)
- Industrial control
- Line cards

Technical Specifications

- e300 core, built on Power Architecture technology, operating from 266 MHz to 667 MHz
  - 32-bit, high-performance superscalar core
  - 1260 MIPS @ 667 MHz; 504 MIPS @ 266 MHz
  - Double-precision floating point, integer, load/store, system register and branch processor units
  - 32 KB data and 32 KB instruction cache with line locking support
- DDR/DDR2 memory controller
  - Programmable timing supporting DDR/DDR2 SDRAM
  - 32- or 64-bit data interface; up to 333 MHz data rate
  - Four banks of memory, each up to 1 GB
  - Full ECC support
- Dual PCI interfaces
  - Two 32-bit PCI 2.2 bus controllers (3.3V I/O; each controller can operate up to 66 MHz)
  - Flexibility to configure the two PCI controllers as a single 64-bit PCI controller

- Dual 10/100/1000 Ethernet controllers
  - 1000 Mbps IEEE 802.3 GMII/RGMII, 802.3z TBI/RTBI, full-duplex
  - 10/100 Mbps IEEE 802.3 MII full and half-duplex
  - Station management interface for control and status
  - Jumbo frame support up to 9.6 KB
- Embedded security engine on E versions only
  - Public key execution (RSA and Diffie-Hellman)
  - Data encryption standard execution (DES and 3DES)
  - Advanced encryption standard (AES) execution
  - ARC Four execution (RC4-compatible algorithm)
  - Message digest execution (SHA, MD5, HMAC)
  - Random number generation (RNG)
- Dual High-Speed USB 2.0 controllers
  - Support for device, host and On-the-Go (OTG) functionality
  - High-speed (480 Mbps), full-speed (12 Mbps) and low-speed (1.5 Mbps) operation
- Local bus controller
  - Multiplexed 32-bit address and data operating up to 133 MHz
  - 32-, 16- and 8-bit port sizes controlled by on-chip memory controller
- Dual UART (DUART)
- Dual I²C interfaces (master or slave mode)
- Four-channel direct memory access (DMA) controller
- Serial peripheral interface
- General-purpose parallel input/output
- IEEE 1149.1 JTAG test access port
- Package options: 35 mm x 35 mm TBGA and 29 mm x 29 mm PBGA (both with 1 mm pitch)
- Process technology: 130 nm CMOS
- Voltage: 1.3V core voltage for 667 MHz

Learn More: For current information about Freescale products and documentation, please visit **www.freescale.com**.